19. Describe the influences of entering, leaving and other groups in substitution reaction.

20. Describe the substitution reaction of cobalt and chromium octahedral complexes.

APRIL/MAY 2024

DCH32/GCH32 — INORGANIC CHEMISTRY — III

Time : Three hours Maximum : 75 marks

Shanmuga Industries Arts & Science College T.V.Malai

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What is meant by ligand substitution reaction?

2. What is a fluxional molecule?

3. What is meant by heterogeneous catalyst? Give an example.

4. Write any two examples for electron transfer reactions.

5. What is the order of a reactant in inner sphere electron transfer process?

6. What are bridging ligands? Give two examples.

7. Give the trans-effect series.

8. List out the factors which influence the rate of substitution reaction in metal complexes.

9. Give two representative reactions for Photo-substitution reaction.

10. What is the role of $[Ru(bpy)_3]^{2+}$ complex in solar energy conversion?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Discuss the fluxional behaviour of organometallic compounds.

Or

(b) Write a brief note on the IR stretching frequencies of M–C bond and – C=O bond in metal carbonyls.

12. (a) Discuss in detail the mechanism of Zeigler-Natta catalyzed polymerisation.

Or

(b) Discuss the Wacker's process of olefin oxidation with mechanism.

13. (a) Discuss about the complementary and non-complementary reactions.

Or

(b) Discuss about the two electron transfer reactions.

14. (a) Describe the substitution reactions of square-planer complexes with suitable examples.

Or

(b) Discuss the reactivity of platinum complexes.

15. (a) Explain the substitution reaction of octahedral cobalt complexes with example.

Or

(b) Write a note on isomerisation process in photochemistry.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. With suitable MO diagrams explain the structure and bonding in ferrocene.

17. Give an account on:

(a) Oxo Process (5)

(b) Wilkinson's Catalyst (5)

18. How are successor and precursor complexes formed? Explain briefly with suitable examples.